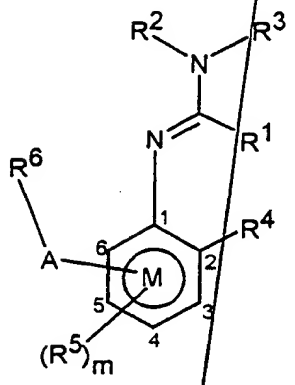
Claims

1 The use of a compound of general formula I and salts thereof as fungicides



(I)

wherein

$R^1$ is alkyl, alkenyl, alkynyl, carbocyclyl or heterocyclyl, each of which may be substituted, or hydrogen;

$R^2$ and $R^3$, which may be the same or different, are any group defined for $R^1$; cyano; acyl; $-OR^a$ or $-SR^a$, where $R^a$ is alkyl, alkenyl, alkynyl, carbocyclyl or heterocyclyl, each of which may be substituted; or $R^2$ and $R^3$, or $R^2$ and $R^1$, together with their interconnecting atoms may form a ring, which may be substituted;

$R^4$ is alkyl, alkenyl, alkynyl, carbocyclyl or heterocyclyl, each of which may be substituted; hydroxy; mercapto; azido; nitro; halogen; cyano; acyl; optionally substituted amino; cyanato; thiocyanato; $-SF_5$; $-OR^a$; $-SR^a$ or $-Si(R^a)_3$;

m is 0 to 3;

when present $R^5$, which may be the same or different to any other $R^5$, is any group defined for $R^4$;

$R^6$ is optionally substituted carbo- or heterocyclyl; and

A is a direct bond, $-O-$, $-S(O)_n-$, $-NR^9-$, $-CR^7=CR^7-$, $-C\equiv C-$, $-A^1-$, $-A^1-A^1-$, $-O-(A^1)_k-O-$, $-O-(A^1)_k-$, $-A^3-$, $-A^4-$, $-A^1O-$, $-A^1S(O)_n-$, $-A^2-$, $OA^2-$, $-NR^9A^2-$, $-OA^2-A^1-$, $-OA^2-C(R^7)=C(R^8)-$, $-S(O)_nA^1-$, $-A^1-A^4-$, $-A^1-A^4-C(R^8)=N-N=CR^8-$, $-A^1-A^4-C(R^8)=N-X^2-X^3-$, $-A^1-A^4-A^3-$,

$-A^1-A^4-N(R^9)-$, $-A^1-A^4-X-CH_2-$, $-A^1-A^4-A^1-$, $-A^1-A^4-CH_2X-$,

$-A^1-A^4-C(R^8)=N-X^2-X^3-X^1-$, $-A^1-X-C(R^8)=N-$, $-A^1-X-C(R^8)=N-N=CR^8-$,

$-A^1-X-C(R^8)=N-N(R^9)-$, $-A^1-X-A^1-X^1-$, $-A^1-O-A^3-$, $-A^1-O-C(R^7)=C(R^8)-$,

$-A^1-O-N(R^9)-A^2-N(R^9)-$, $-A^1-O-N(R^9)-A^2-$, $-A^1-N(R^9)-A^2-N(R^9)-$,

$-A^1-N(R^9)-A^2-$, $-A^1-N(R^9)-N=C(R^8)-$, $-A^3-A^1-$, $-A^4-A^3-$, $-A^2-NR^9-$,

$-A^1-A^2-X^1-$, $-A^1-A^1-A^2-X^1-$, $-O-A^2-N(R^9)-A^2-$, $-CR^7=CR^7-A^2-X^1-$,

$-C\equiv C-A^2-X^1-$, $-N=C(R^8)-A^2-X^1-$, $-C(R^8)=N-N=C(R^8)-$, $-C(R^8)=N-N(R^9)-$,

$-(CH_2)_2-O-N=C(R^8)-$ or $-X-A^2-N(R^9)-$

where

n is 0, 1 or 2,

k is 1 to 9,

$A^1$ is $-CHR^7-$,

$A^2$ is $-C(=X)-$,

$A^3$ is $-C(R^8)=N-O-$,

$A^4$ is $-O-N=C(R^8)-$,

X is O or S,

$X^1$ is O, S, $NR^9$ or a direct bond,

$X^2$ is O, $NR^9$ or a direct bond,

$X^3$ is hydrogen, $-C(=O)-$, $-SO_2-$ or a direct bond,

$R^7$, which may be the same or different to any other $R^7$, is alkyl, cycloalkyl or phenyl, each of which may be substituted; or is hydrogen, halogen, cyano or acyl;

$R^8$, which may be the same or different to any other $R^8$, is alkyl, alkenyl, alkynyl, alkoxy, alkylthio, carbo- or heterocyclyl, each of which may be substituted; or is hydrogen;

$R^9$, which may be the same or different to any other $R^9$, is optionally substituted alkyl, optionally substituted carbo- or heterocyclyl, hydrogen or acyl; or two $R^9$ groups on A, together with the connecting atoms, form a 5 to 7 membered ring;

where the moiety depicted on the right side of linkage A is attached to $R^6$;

or –A-$R^6$ and $R^5$ together with benzene ring M form an optionally substituted fused ring system.

2 The use according to claim 2 wherein $R^1$ is alkyl, alkenyl or alkynyl, each of which may be substituted by alkoxy, haloalkoxy, alkylthio, halogen or optionally substituted phenyl; or is hydrogen.

3 The use according to claim 1 wherein $R^1$ is $C_1$-$C_{10}$ alkyl or hydrogen.

4 The use according to any preceding claim wherein $R^2$ and $R^3$, which may be the same or different, are alkyl, alkenyl or alkynyl, each of which may be substituted by alkoxy, haloalkoxy, alkylthio, halogen, optionally substituted phenyl; or is hydrogen; alkoxy; alkoxyalkoxy; benzyloxy; cyano; or alkylcarbonyl.

5 The use according to claim 4 wherein $R^2$ and $R^3$, which may be the same or different, are $C_1$-$C_{10}$ alkyl or hydrogen.

6 The use according to any preceding claim wherein $R^4$ is alkyl, alkenyl, or alkynyl, each of which may be substituted by alkoxy, haloalkoxy, alkylthio, halogen or optionally substituted phenyl; or is hydroxy; halogen; cyano; acyl; alkoxy; haloalkoxy; or alkylthio.

7 The use according to claim 6 wherein $R^4$ is $C_1$-$C_{10}$ alkyl or halogen.

8 The use according to any preceding claim wherein m is 0 or 1.

9 The use according to any preceding claim wherein, when present, $R^5$ is a group defined for $R^4$ in claim 6.

10 The use according to any preceding claim wherein when present, the group $R^5$ is attached at the 5 position of ring M.

11 The use according to any preceding claim wherein A is a direct bond, -O-, $-S(O)_nA^1-$, $-O(A^1)_k-$, $-S(O)_n-$, $-NR^9A^2-$, $-A^2-$, $-OA^2-$, $-OA^2-A^1-$, $-NR^9-$ or $-O(A^1)_kO-$.

12 The use according to claim 11 wherein A is a direct bond, –O-, -S-, $-NR^9-$, $-CHR^7-$ or $-O-CHR^7-$.

13 The use according to any preceding claim wherein, when present, $R^9$ is alkyl, alkenyl, or alkynyl, each of which may be substituted by alkoxy, haloalkoxy, alkylthio, halogen or optionally substituted phenyl; or is hydrogen

14 The use according to any preceding claim wherein, when present, $R^7$ is alkyl, alkenyl, or alkynyl, each of which may be substituted by alkoxy, haloalkoxy, alkylthio, halogen or optionally substituted phenyl; or is hydroxy; halogen; cyano; acyl; alkoxy; haloalkoxy; alkylthio; or hydrogen.

15 The use according to any preceding claim wherein A is attached to the 4 position of benzene ring M.

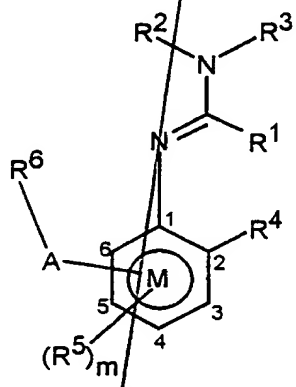
16 The use according to any preceding claim wherein $R^6$ is optionally substituted phenyl or optionally substituted aromatic heterocyclyl.

17 The use according to any preceding claim wherein when substituted, $R^6$ may be substituted by one or more substituents, which may be the same or different, and may be selected from the list: alkyl, alkenyl, alkynyl, carbo- or heterocyclyl, each of which may be substituted; hydroxy; mercapto; azido; nitro; halogen; cyano; acyl; optionally substituted amino; cyanato; thiocyanato; $-SF_5$; $-OR^a$; $-SR^a$ and $-Si(R^a)_3$, where $R^a$ is alkyl, alkenyl, alkynyl, carbocyclyl or heterocyclyl, each of which may be substituted.

18 The use according to claim 17 wherein when substituted, $R^6$ may be substituted by one or more substituents, which may be the same or

different, and may be selected from the list: hydroxy; halogen; cyano; acyl; amino; alkylamino; dialkylamino; alkyl; haloalkyl; $R^a$O-alkyl; acyloxyalkyl; cyano-oxyalkyl; alkoxy; haloalkoxy; alkylthio; carbocyclyl, optionally substituted by alkyl, haloalkyl, alkoxy, haloalkoxy or alkylthio; and benzyl optionally substituted by alkyl, haloalkyl, alkoxy, haloalkoxy or alkylthio.

19 The use of a compound of general formula I and salts thereof as fungicides



(I)

wherein:

$R^1$ is alkyl, alkenyl or alkynyl, each of which may be substituted by alkoxy, haloalkoxy, alkylthio, halogen or phenyl optionally substituted by alkyl, haloalkyl, alkoxy, haloalkoxy, alkylthio or halogen; or is hydrogen;

$R^2$ and $R^3$, which may be the same or different, are as defined for $R^1$, or are alkoxy, alkoxyalkoxy, benzyloxy, cyano or alkylcarbonyl;

$R^4$ is alkyl, alkenyl or alkynyl, each of which may be substituted by alkoxy, haloalkoxy, alkylthio, halogen or phenyl optionally substituted by alkyl, haloalkyl, alkoxy, haloalkoxy, alkylthio or halogen; or is hydroxy; halogen; cyano; or acyl;

m is 0 or 1;

when present, $R^5$ is a group defined for $R^4$;

A is a direct bond, –O-, -S-, -$NR^9$-, -$CHR^7$- or -O-$CHR^7$-,

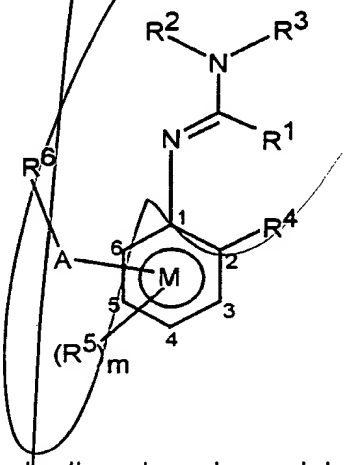
wherein, when present, $R^9$ is alkyl, alkenyl, or alkynyl, each of which may be substituted by alkoxy, haloalkoxy, alkylthio, halogen or phenyl optionally substituted by alkyl, haloalkyl, alkoxy, haloalkoxy, alkylthio, or halogen; or is hydrogen; and $R^7$ is a group defined for

$R^9$, or is hydroxy; halogen; cyano; acyl; alkoxy; haloalkoxy or alkylthio;

A is attached to the 4 position of benzene ring M; and

$R^6$ is phenyl or aromatic heterocyclyl, optionally substituted by one or more substituents, which may be the same or different, and may be selected from the list: hydroxy; halogen; cyano; acyl; amino; alkylamino; dialkylamino; alkyl; haloalkyl; $R^aO$-alkyl; acyloxyalkyl; cyano-oxyalkyl; alkoxy; haloalkoxy; alkylthio; carbocyclyl, optionally substituted by alkyl, haloalkyl, alkoxy, haloalkoxy or alkylthio; and benzyl optionally substituted by alkyl, haloalkyl, alkoxy, haloalkoxy or alkylthio.

A compound of general formula I and salts thereof



(I)

wherein

$R^1$ is alkyl, alkenyl, alkynyl, carbocyclyl or heterocyclyl, each of which may be substituted, or is hydrogen;

$R^2$ and $R^3$, which may be the same or different, are any group defined for $R^1$, or together with the nitrogen to which they are attached may form a ring, which may be substituted;

$R^4$ is alkyl, alkenyl, alkynyl, carbocyclyl or heterocyclyl, each of which may be substituted;

m is 1;

$R^5$ is any group defined for $R^4$ attached to the 5-position of the benzene ring M;

$R^6$ is optionally substituted carbo- or heterocyclyl; and

A is a direct bond; –O–; -S-; -$NR^9$- where $R^9$ is alkyl, alkenyl, or alkynyl, each of which may be substituted by alkoxy, haloalkoxy, alkylthio, halogen or optionally substituted phenyl; -$CHR^7$- or -O-$CHR^7$-, where $R^7$ is alkyl, alkenyl, or alkynyl, which may be substituted by alkoxy, haloalkoxy, alkylthio, halogen or phenyl optionally substituted by alkyl, haloalkyl, alkoxy, haloalkoxy or alkylthio; or is hydroxy; halogen; cyano; acyl; alkoxy; haloalkoxy; or alkylthio;

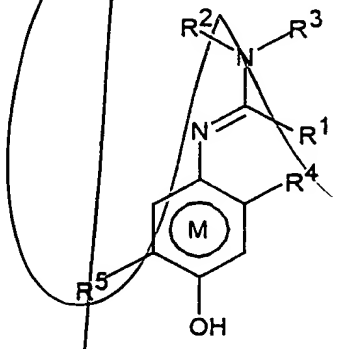
where –A-$R^6$ is in the 4-position of the benzene ring M and the moiety depicted on the right side of linkage A is attached to $R^6$;

or –A-$R^6$ and $R^5$ together with benzene ring M form an optionally substituted fused ring system.

21 A fungicidal composition comprising at least one compound as claimed in claim 20 in admixture with an agriculturally acceptable diluent or carrier.

22 A method of combating fungi at a locus infested or liable to be infested therewith, which comprises applying to the locus a compound as defined in any preceding claim.

23 A compound of general formula XIIa,




(XIIa)

where

$R^1$ is alkyl, alkenyl, alkynyl, carbocyclyl or heterocyclyl, each of which may be substituted, or is hydrogen;

$R^2$ and $R^3$, which may be the same or different, are any group defined for $R^1$; cyano; acyl; -$OR^a$ or -$SR^a$, where $R^a$ is alkyl, alkenyl, alkynyl,

carbocyclyl or heterocyclyl, each of which may be substituted; or $R^2$ and $R^3$, or $R^2$ and $R^1$, together with their interconnecting atoms may form a ring, which may be substituted;

$R^4$ is alkyl, alkenyl, alkynyl, carbocyclyl or heterocyclyl, each of which may be substituted; and

$R^5$ is any group defined for $R^4$;

with the proviso that $R^5$ is not *tert*-butyl.